CLAIMS

1. A method of providing a desired constant AC voltage to a variable load which is arranged remote of a voltage source, comprising the steps of:

- compensating for a voltage drop over an electrical supply line which connects the load to the voltage source by a compensation AC voltage;
- the compensation AC voltage being added to the desired constant AC voltage to determine an output AC voltage of the voltage source;
- varying the compensation AC voltage depending both on an absolute value of an alternating current conducted to the load and on a phase angle phi between the output AC voltage of the voltage source and the alternating current.

2. The method of claim 1, wherein the step of varying the compensation AC voltage depending both on the absolute value of the alternating current conducted to the load and on the phase angle phi comprises the step of calculating the compensation AC voltage from two summands which are supply linearly dependent on the total value of the alternating current, and one of which is additionally supply linearly dependent on cos(phi) and the other of which is additionally supply linearly dependent on sin(phi).

3. The method of claim 2, further comprising the steps of connecting an ohmic load instead of the variable load via the supply line to the AC voltage source, measuring a total value of the output AC voltage ($|U_{full}|$ provided by the voltage source, a total value of a AC voltage $|U_{load}|$ dropping over the ohmic load, and a total value of the alternating current $|I|$ which is conducted at that same time, and determining a first constant C_R for the supply linear variation of the compensation AC voltage with the total value of the alternating current and cos(phi) from the measured values.

4. The method of claim 3, wherein the constant C_R is determined as $(|U_{full}|-|U_{load}|)/|I|$.

5. The method of claim 3, further comprising the steps of connecting a mixed ohmic and inductive load instead of the variable load via the supply line to the AC voltage source, measuring a total value of the output AC voltage $|U_{full}|$ provided by the voltage source, a total value of the AC voltage $|U_{load}|$ dropping over the ohmic load, a total value of the current |I| conducted at the same time, and the phase angle phi, and determining a second constant C_L for the supply linear variation of the compensation AC voltage with the total value of the alternating current and sin(phi) from the measured values.

6. The method of claim 5, wherein the mixed ohmic and inductive load at the place of the variable load is the variable load itself.

7. The method of claim 5, wherein the constant C_L is determined as as $[|U_{full}| - |U_{load}| - C_R * |I| * \cos(phi)]/[|I| * \sin(phi)]$.

8. The method of claim 5, wherein the constant C_L is determined at a value of $|U_{load}|$ which is about equal to the desired constant AC voltage.

9. The method of claim 8, wherein the constant C_R is determined at a value of $|U_{load}|$ which is about equal to the desired constant AC voltage.

10. The method of claim 8, wherein the constants C_R and C_L are at first approximated at a value of $|U_{full}|$ which is about equal to the desired constant AC voltage, and that then a value of $|U_{load}|$ which is equal to the desired constant AC voltage is approached with the approximated values of C_R and C_L.

11. The method of claim 1, wherein the voltage source is a rotating frequency converter, and further comprising the step of varying an exciting power of a generator to achieve a variation of the compensation AC voltage.

12. The method of claim 1, wherein the voltage source is selected from a static frequency converter and an electronically controlled transformer, and further comprising the step of separately varying the compensation AC voltage for each phase of the output AC voltage of the voltage source.

13. A method of providing a desired constant AC voltage having a frequency at least 200 Hz to an airplane which is positioned on the ground remote of a voltage source and which is connected to the voltage source via a supply line, comprising the steps of:

- connecting an ohmic load via the supply line to the AC voltage source, measuring a total value of the output AC voltage ($|U_{full}|$ provided by the voltage source, a total value of a AC voltage $|U_{load}|$ dropping over the ohmic load, and a total value of the alternating current $|I|$ which is conducted at that same time;
- determining a first constant C_R as $(|U_{full}|-|U_{load}|)/|I|$;
- connecting a mixed ohmic and inductive load via the supply line to the AC voltage source, measuring a total value of the output AC voltage $|U_{full}|$ provided by the voltage source, a total value of the AC voltage $|U_{load}|$ dropping over the ohmic load, a total value of the current $|I|$ conducted at the same time, and the phase angle phi;
- determining a second constant C_L as $[|U_{full}| - |U_{load}| - C_R * |I| * \cos(phi)]/[|I| * \sin(phi)]$;
- connecting the airplane via the supply line to the voltage source;
- repeatedly calculating a compensation AC voltage as $|I|*C_R*\cos(phi) + |I|*C_L*\sin(phi)$ and adding the compensation AC voltage to the desired constant AC voltage to determine an output AC voltage of the voltage source, $|I|$ being the total value of the actual alternating current conducted from the voltage source to the airplane and phi being the actual phase angle between the output AC voltage of the voltage source and the alternating current conducted from the voltage source to the airplane.

14. The method of claim 13, further comprising the steps of:

- connecting another airplane via the supply line to the voltage source;
- repeatedly calculating a compensation AC voltage as $|I|*C_R*\cos(phi) + |I|*C_L*\sin(phi)$ and adding the compensation AC voltage to the desired constant AC voltage to determine an output AC voltage of the voltage source, |I |being the total value of the actual alternating current conducted from the voltage source to the other airplane and phi being the actual phase angle between the output AC voltage of the voltage source and the alternating current conducted from the voltage source to the other airplane.